

#### ABSTRACT

Digital data of a specific plurality of data channels ( $K_0$ - $K_n$ ) of the input side supplied in parallel form are converted into a serial data stream (D) and are in turn divided into parallel data channels ( $K_0$ - $K_n$ ) of the output side upon reception with the assistance of a corresponding demultiplexing. In order to enable the allocation of the bits of the data channels ( $K_0$ - $K_n$ ) of the input side read-in in parallel without great circuit-oriented outlay and without additional synchronization information, it is proposed to monitor the serial data stream (D) transmitted in the form of ATM cells for the occurrence of a specific bit sequence that is already transmitted with every cell format. The position of the individual bits of the corresponding data channels ( $K_0$   $K_n$ ) in the serial, optical data stream can be determined on the basis of this characteristic bit sequence, so that a correct parallelization of the data stream (D) at the output side is possible.